

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all previous claim listings and versions:

1. (Currently Amended) A method of making an optical information storage medium, the method comprising:
 - (a) disposing a polymerizable composition between a base and a covering layer, at least one of the base and the covering layer having a first relief pattern on a side facing the polymerizable composition;
 - (b) spinning the base, the polymerizable composition and the covering layer in a centrifuge to distribute the polymerizable composition;
 - (c) polymerizing the polymerizable composition while the polymerizable composition is distributed between the base and the covering layer to form a polymerized layer having a second relief pattern corresponding to the first relief pattern;
 - (d) separating the polymerized layer from the first relief pattern; and
 - (e) filling the second relief pattern with a fluorescent information storage material by providing a filling composition comprising a fluorescent dye; and filling the second relief pattern with the filling composition, with the filling composition comprising a polymerizable substance and a solvent, wherein the polymerizable substance comprises ~~glycidyl ether~~ a first compound having at least one glycidyl ether functionality that is polymerizable by hybrid mechanism in an amount of 0.1-85 wt% of the substance, ~~epoxide~~ a second compound having an epoxy group that is polymerizable by cation mechanism in an amount of 5-90 wt% of the substance, and a first alcohol in an amount of 0-10 wt% of the substance, and wherein the solvent comprises a second alcohol that is different from the first alcohol.
2. (Previously Presented) The method of claim 1, wherein the polymerizable composition is photopolymerizable in light having a photopolymerizing wavelength; the covering layer is transparent to the photopolymerizing wavelength; and step (c) comprises applying the light having the photopolymerizing wavelength to the polymerizable composition through the covering layer.

3-16. (Cancelled)

17. (Previously Presented) The method of claim 1, wherein the polymerizable substance comprises bis(4-glycidyloxyphenyl) methane in an amount of 80 wt% of the substance, 1,2,7,8-diepoxyoctane in an amount of 10 wt% of the substance and neopentylglycol in an amount of 10 wt% of the substance; the fluorescent dye comprises rhodamine 6G; and the solvent comprises 2-ethoxyethanol, 2-propanol and ethanol in a proportion of 2:2:1 by volume.

18. (Withdrawn) The method of claim 1, wherein the polymerizable substance comprises bisphenol A diglycidyl ether in an amount of 75 wt% of the substance, 1,4-cyclohexanedimethanol diglycidyl ether in an amount of 5 wt% of the substance, and 1,2,7,8-diepoxyoctane in an amount of 20 wt% of the substance; the fluorescent dye comprises coumarin 314; and the solvent comprises 2-ethoxyethanol, 4-hydroxy-4-methyl-2-pentanone, 2-propanol and ethanol in a proportion of 1:1:2:1 by volume.

19. (Withdrawn) The method of claim 1, wherein the polymerizable substance comprises bisphenol A diglycidyl ether in an amount of 70 wt% of the substance, 1,4-butanediol diglycidyl ether in an amount of 15 wt% of the substance, bis(3,4-epoxycyclohexylmethyl) adipate in an amount of 5 wt% of the substance and neopentyl glycol ethoxylate in an amount of 10 wt% of the substance; the fluorescent dye comprises coumarin 153; and the solvent comprises 4-hydroxy-4-methyl-2-pentanone, 1-butanol, 2-propanol, ethyleneglycol and 2,2,3,3-tetrafluoro-1-propanol in a proportion of 1:1:2:1:0.5 by volume.

20. (Cancelled)

21. (Withdrawn) The method of claim 1, wherein the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate in an amount of 80 wt% of the substance, 3-diglycidyl-1,2-cyclohexanedicarboxylate in an amount of 8 wt% of the substance, poly[(o-cresyl glycidyl ether)-co-formaldehyde] in an amount of 2 wt% of the substance and poly(caprolactone) triol in an amount of 10 wt% of the substance; the fluorescent dye comprises oxazine 1; and the solvent comprises 4-hydroxy-4-methyl-2-pentanone, 2-

methyl-3-heptanone, 3-methyl-2-butanone and cyclohexanone in a proportion of 1:1:2:2 by volume.

22. (Withdrawn) The method of claim 1, wherein the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate in an amount of 80 wt% of the substance, glycerol proxylate triglycidyl ether in an amount of 0.1 wt% of the substance, and poly(vinylbutyral-co-vinylalcohol-co-vinyl acetate in an amount of 9.9 wt% of the substance; the fluorescent dye comprises oxazine 1; and the solvent comprises 2-ethoxyethanol, 1-butanol, 2-propanol and 3-methyl-2-butanone in a proportion of 4:4:2:1 by volume.

23-24. (Cancelled)

25. (Withdrawn) The method of claim 1, wherein the polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate in an amount of 10 wt% of the substance, 4-vinyl-1-cyclohexane diepoxide in an amount of 70 wt% of the substance, poly(propylene glycol) diglycidyl ether in an amount of 10 wt% of the substance, and glycidyl methacrylate in an amount of 10 wt% of the substance; the fluorescent dye comprises rhodamine 6G; and the solvent comprises 4-hydroxy-4-methyl-2-pentanone, 1-butanol, 1,1,1,5,5,6,6,6-octafluoro-2,4-hexanedione, and methylethyl ketone in a proportion 2:2:1:1 by volume.

26-30. (Cancelled)

31. (Withdrawn and Currently Amended) The method of ~~claim 29~~ claim 1, wherein the ~~filling composition~~ polymerizable substance comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate in an amount of 80 wt% of the ~~filling composition~~ substance, glycerol proxylate triglycidyl ether in an amount of 0.1 wt% of the ~~filling composition~~ substance and poly(vinylbutyral-co-vinylalcohol-co-vinyl acetate in an amount of 9.9 wt% of the ~~filling composition~~ substance.

32. (Previously Presented) The method of claim 1, further comprising (f) repeating steps (a)-(e) a plurality of times to form a plurality of information layers; and (g) adhering the plurality of information layers together to form the optical information storage medium as a multilayer medium.

33. (Previously Presented) The method of claim 32, wherein the polymerizable composition is doped with a mixture that is 25% by weight bis(2,6-dimethoxybenzoyl)-2,4,4-trimethylpentylphosphine oxide and 75% by weight of 2-hydroxy-2-methyl-1-phenylpropan-1-one in an amount of 3 wt% of the polymerizable composition.

34. (Previously Presented) The method of claim 32, wherein the polymerizable composition is doped with benzoyl peroxide in an amount of 4 wt% of the polymerizable composition and dibutylaniline in an amount of 0.1wt% of the polymerizable composition.

35-37. (Cancelled)

38. (Withdrawn and Currently Amended) A method of making an optical information storage medium according to claim 1, ~~the method comprising:~~

~~(a) disposing a polymerizable composition between a base and a covering layer, at least one of the base and the covering layer having a first relief pattern on a side facing the polymerizable composition;~~

~~—— (b) spinning the base, the polymerizable composition and the covering layer in a centrifuge to distribute the polymerizable composition;~~

~~(c) polymerizing the polymerizable composition while the polymerizable composition is distributed between the base and the covering layer to form a polymerized layer having a second relief pattern corresponding to the first relief pattern;~~

~~—— (d) separating the polymerized layer from the first relief pattern; and~~

~~—— (e) filling the second relief pattern with a fluorescent information storage material,~~

wherein the polymerizable composition comprises alkylacrylate and triacrylate in a ratio of about 1:0.25 to 1:16, and a photoinitiator.

39. (Withdrawn) The method of claim 38, wherein the photoinitiator is present in an amount of 2-4 wt% of the polymerizable composition.

40. (Withdrawn) The method of claim 38, wherein the polymerizable composition comprises oligocarbonate methacrylate in an amount of about 20 wt% of the polymerizable composition, aliphatic urethane triacrylate in an amount of about 80 wt% of the polymerizable composition, and 2,2,-dimethoxy-1,2-diphenylethan-1-one in an amount of about 2 wt% of the polymerizable composition.

41. (Withdrawn) The method of claim 38, wherein the polymerizable composition comprises 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate in an amount of about 10 wt% of the polymerizable composition, polypropylenglycol in an amount of about 2 wt% of the polymerizable composition, tripropyleneglycol divinyl ester in an amount of about 15 wt% of the polymerizable composition, trimethylolpropane triacrylate in an amount of about 15 wt% of the polymerizable composition, and oligocarbonate methacrylate in an amount of about 58 wt% of the polymerizable composition; and

step (c) comprises using a photoinitiator comprising a mixture of 50% by weight 1-hydroxycyclohexyl phenyl ketone and 50% by weight benzophenone in an amount of about 2 wt% of the polymerizable composition, and triarylsulfonium hexafluorophosphate in an amount of 2 wt% of the polymerizable composition.

42. (Withdrawn) The method of claim 38, wherein the photoinitiator comprises a quinone, an amine, or a mixture of a quinone and amine.

43. (Withdrawn) The method of claim 42, wherein the photoinitiator comprises a quinone in an amount of 2 wt% of the polymerizable composition and an amine in an amount of 1 wt% of the polymerizable composition.

44. (Withdrawn) The method of claim 42, wherein the quinone is phenanthrenequinone or camphorquinone and the amine is triethanolamine.

45. (Withdrawn) The method of claim 38, wherein the polymerizable composition comprises modified urethane triacrylate in an amount of about 23 wt% of the polymerizable composition, 2-(2-ethoxyethoxy)ethyl-acrylate in an amount of about 5 wt% of the polymerizable composition, monopropyleneglycol acrylate in an amount of about 15 wt% of the polymerizable composition, propoxylated trimethylopropane triacrylate in an amount of about 57 wt% of the polymerizable composition, and bis(η 5-2,4-cyclopentadien-1-yl)-(bis(2,6-difluoro-3-(1H-pyr-rol-1-yl)-phenyl)titanium in an amount of about 2 wt% of the polymerizable composition.

46. (Withdrawn) The method of claim 38, wherein the photoinitiator comprises eosin B in an amount of 1 wt% of the polymerizable composition, dibutylaniline in an amount of 1 wt% of the polymerizable composition, and 2,2,-dimethoxy-1,2-diphenylethan-1-one in an amount of 2 wt% of the polymerizable composition.

47-50. (Cancelled)